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| 10/764,805 | 01/26/2004 | Hironori Kakiuchi | 890050.457 | 9756 |

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| EXAMINER | |
|---|---|
| ANGEBRANNDT, MARTIN J | |
| ART UNIT | PAPER NUMBER |
| 1795 | |
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| 10/17/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/764,805 | KAKIUCHI ET AL. | |
| | Examiner | Art Unit | |
| | Martin J. Angebranndt | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Response the arguments of the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Xu et al. CN 1330368 or Shuy et al. '160, in view of Suzuki et al. '752, Morimoto et al. '345, Shigeta et al. JP 59-225992 and Kinoshita et al. JP 2000-285509 (machine translation enclosed), combined with either of (Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723),

Xu et al. CN 1330368 teaches a transparent layer of Ge, Si, GaP, InP, GaAs, InAs, ZnSb, $TiO_2$, Sb-Zn oxide as a transparent layer (30) and reflective layer (40) may be Ag, Al, Au, Pt, Cu, Sn, Ir, Ta and alloys and/or combinations thereof. (abstract). The transparent layer may be 5-500 nm thick (4/7-12) and the reflective layer may be 1-500 nm. (4/13-20). The example uses silicon and gold as the materials. In figure 1A, the provision of thermal manipulation layers (dielectric layers) is disclosed and the use of protective layers is disclosed. (60). The examiner has only had a spot translation made, if the applicant has a written English translation made the examiner would appreciate a copy with the next response. (Shuy et al. '160 is not the corresponding English document, although they are similar)

Shuy et al. '160 teaches a transparent layer of Ge, Si, GaP, InP, GaAs, InAs, ZnSb, $TiO_2$, Sb-Zn oxide as a transparent layer (30) in a thickness of 5-500 nm and reflective layer (40) may be Ag, Al, Au, Pt, Cu, Sn, Ir, Ta and alloys and/or combinations thereof in a thickness of 1-500

nm. [0026-0027]. The examples use silicon and gold as the materials. In figure 1A, the provision of thermal manipulation layers (dielectric layers) is disclosed and the use of protective layers is disclosed. (60).

Suzuki et al. '752 teaches examples 68-71, which have a substrate, a first 10 nm In alloying sublayer, a second 10 nm Te alloying sublayer, a dielectric layer, an Al reflective layer and a 10 micron UV cured layer and the layers undergo alloying to cause a change in reflectance. (26/15-54 and table 7). Examples 43-49 (table 5 teach the use of a bedding layer between the substrate and the recording bilayer (col 21). The use of In, Sn, Pb, Zn or alloys including these for the first recordinglayer is disclosed. (6/1-16). Useful second layer materials include group 5B or 6B elements, such as As,Se,Sb, Te and alloys of these with other elements including Cu, and the like (6/59-7/35) The bedding layer can be various dielectric materials and prevent moisture penetration through the substrate into the recording layers (21/40-44 & 9/59-10/22). The addition of an upper dielectric and/or reflective layer between the recording layer and UV cured protective layer is disclosed for adjusting reflectance, regulating heat conduction and preventing corrosion of the recording layer (10/53-11/26). The protective layer can be 0.1- 100 microns in thickness (9/3-7)

Yoshida et al. JP 10-143919 (machine translation attached) teaches the addition of Al to Cu in amounts of 1-30% to improve the corrosion resistance [0017]. The addition of Fe, Mn, Au, Pt, Pd, Ti, Mo, Ta, Zr, V, W, etc in amounts of 0.1-10% to further improve the corrosion resistance is disclosed [0018]. Example 4 uses 20% Al. [0033].

Aratani et al. EP 1122723 teach reflective layer composition and exemplify $Cu_{82.5}Al_{17.5}$ (table 2, page 7). The reflective films functions to allow recording [0044-0045]. Useful Cu based alloys are disclosed. [0050-0051].

Morimoto et al. '345 teaches that the reflective layer may be on the same side of the recording film as the substrate if topside recording is to be used and on the opposite side of the recording films from the substrate if recording is to take place through the substrate (6/42-65). The dielectric layers (metallic compounds layers) are disclosed as providing improvements in the stability and sensitivity (7/42-8/12). The prevention of direct contact with the recording layer is disclosed. (7/1-10). The protective layer can be organic materials (14/62-15/5).

Shigeta et al. JP 59-225992 teach mixing of layers (1) and (2) and establishes that the order is not important (see figures). The use of a Cu layer as the metal and $SnO_2$, ZnO, $Al_20_3$, $In_20_3$ oxide layers is disclosed in table 2.

Kinoshita et al. JP 2000-285509 teach with respect to drawing 1, a substrate, an Au layer, a dielectric layer, a 10 nm Al layer a Ge layer and a protective layer [0015-0016].

It would have been obvious to one skilled in the art to modify the examples corresponding to figure 1Aof **either** Xu et al. CN 1330368 or Shuy et al. '160 by using **Cu alloys** with less than 10-30% of Al, such as those disclosed by either of Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723 in place of the Au layer with a reasonable expectation of forming a useful alloying optical recording medium based upon the disclosure of equivalence of the reflective layer materials including Cu alloys by **either** Xu et al. CN 1330368 or Shuy et al. '160, where the Cu layer does not suffer from corrosion based upon the teachings of either of Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723 and to add a reflective layer between

layers 50 and 60 as taught by Suzuki et al. '752 to adjust the reflectivity. Further, it would have been obvious modify the resulting media by using other disclosed transparent layer materials, such as InP, ZnSb, InAs or Ge in place of the Si used in the example with a reasonable expectation of forming a useful alloying optical recording and further to reverse the order of the two films forming the bilayer as discussed by Shigeta et al. JP 59-225992 with a reasonable expectation of the recording medium functioning based upon the disclosure of equivalence of the two orientations and/or placing the reflective layer between the substrate and layer 20 to allow recording with the light incident through the protective layer based upon the disclosure of the function of the reflective layer on either side by Morimoto et al. '345 and the prior use of the this ordering in the alloying media of Kinoshita et al. JP 2000-285509, which lends a reasonable expectation of success.

In response to the arguments, the examiner notes that corrosion of Cu is known in the art as evidenced by Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723 and that corrosion of the alloying layers in known in the art as evidenced by Suzuki et al. '752, which describes the addition of dielectric layers as a mode for addressing this. In the case of the addition of a reflective layer between layers 50 and 60 of figure 1A as discussed in the rejection, the recording layer is between transparent layer 20 and the reflective layer. The claims rejected under this heading do not recite the position of the light transmission layer as the outermost layer as claims 9 and 15-18 do. The claims require at least one recording bilayer and so a single alloying bilayer is embraced by the claims, the applicants use of the 'plurality' language in the arguments is reaching and fails to clearly account for the embodiments where a single recording bilayer is

used. The Xu et al. CN 1330368, Shuy et al. '160 and Suzuki et al. '752 each include alloying bilayers and so that enbodiment is clearly taught. The instant application could present data evidencing an unobvious result by comparing the Cu alloy embodiments of the claimed invention with those using only Cu in the recording layer, where the recording media are formed without contact with oxygen and kept under an inert atmosphere, such as argon or nitrogen, until testing. The applicant might use nitrides as the dielectric layer materials to accomplish this. This would allow the applicant to evidence unexpected results which are not dependent upon the anti-corrosion properties of the Cu-Al alloys of the claimed invention. Clearly, the motivation to add the Al to prevent/reduce corrosion of the Cu layer is present in the art as evidenced by Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723 and further the desire to prevent corrosion in alloying recording layers is known as evidenced in Suzuki et al. '752, so the prior art of record, which is all within the optical recording media art, does serve to direct one to the addition of Al to the Cu layer.

The examiner notes that the claims are all directed to the media, and the thicknesses of the recording sub layers/bilayers is taught in the art, thereby rendering the recited reflectance properties obvious or more properly anticipated by the media rendered obvious by the rejection above. The use of the laser need not be shown as this is not part of the medium, nor are the claims directed to the method of use.

The examiner discusses the thickness of each of the layers forming the recording bilayer to address the issue of the light transmittance of the recorded regions recited in claims 20-25. These values will be dependent upon the thickness of the layers which make up the recording bilayer. The applicant point to the data in figure 17 which evidences reduced jitter for the range

of 10-30 % Al. The examiner notes that the entire range of jitter shown in that figure is ~5.5 to 7.5%, so the showing is not pronounced enough to warrant patentabilty. Further, there is a basis for the addition of Al to Cu layer to reduce corrosion in the prior art reduce corrosion. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The applicant admits on page 8 of the response that Shuy et al. teach alloys of Cu and Al, but fails to appreciate that the lack of a teachings of amounts/proportions is made up in the other references, which describe corrosion resistance as a reason to add Al to Cu, a benefit which would reasonably be realized in the media resulting from the combination of either Xu et al. CN 1330368 or Shuy et al. '160, in view of Suzuki et al. '752 combined with either of Yoshida et al. JP 10-143919 or Aratani et al. EP 1122723. The reduced reflectivity when too much l is present would also affect the difference in the refractivity/transmittance of the recorded/unrecorded areas and reduce the contrast between them. This addresses the issue of the difference in jitter raised by the applicant.

In response to the arguments of 08/21/2008, translation of JP 59-225992 and CN 1330368 are made of record. These were of record in application 10/406109 as of 01/024/08. It is clear in the office actions that the examiner is relying upon the documents themselves. The amendment to the claims limits the claims to embodiments where the reflective layer is on the substrate side of the recording bilayer as otherwise the light does not reach the recording bilayer when exposed through the protective layer. The claims merely add the reflective layer between

the substrate and dielectric layer adjacent the recording bilayer of Xu et al. CN 1330368 or Shuy et al. '160 in a manner similar to that shown in Suzuki et al. '752, but on the opposite side of the recording bilayer from that exemplfied in the Suzuki et al. '752 reference. The viability of this alternative ordering is provided by Morimoto et al. '345 and Kinoshita et al. JP 2000-285509, who teach the use of the reflective layer adjacent to the substrate and Shigeta et al. JP 59-225992 who teaches the equivalence of the order of the two layers which form the recording bilayer. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It is well appreciated that two materials having a different electromotive potential in contact will cause corrosion of one of these. The most common example of this is copper in contact with other metals, such as Al or Fe as these are common building materials used together and cause leaks in the water pipes of homeowners. The effects of corrosion on copper layers in optical recording media is appreciated in the art as is the use of alloying to ameliorate its effects as evidenced by Yoshida et al. JP 10-143919 and Aratani et al. EP 1122723. The applicant may have a basis for arguing that the thickness of the layers forming the recording bilayers is optimized for recording/readout with lasers operating in the 380-450 nm range. The language describing the small transmittance differences fails to appreciate that with the reflective layer, the recording process uses the change in the refractive index of the bilayer areas and the mixed areas as discussed in Suzuki et al. at 7/58-6/19 (push-pull). Therefore the change in the transmittance is not relied upon as argued/implied by the applicant and there is no benefit ascribed to this. The examiner notes that

at this point the position argued is one of intended use as there are no method claims under prosecution.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebranndt/
Primary Examiner, Art Unit 1795

Martin J Angebranndt
Primary Examiner
Art Unit 1795

10/14/2008